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Nuclear magnetic resonance in spin Luttinger liquids

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Effective low-energy description of interacting quantum particles in one dimension is called a Luttinger liquid (LL). Its main property is the existence of gapless excitations characterized by correlation functions decaying as power laws, with exponents being simple functions of the dimensionless exponent K. The physics of a LL is quite elegant as it is directed by two LL parameters only: exponent K and velocity of excitations u. Chains and ladders of antiferromagnetically coupled electronic spins are examples of LL's. Nuclear magnetic resonance (NMR) is a precise probe for the lattice dynamics on the frequency scale of 100 MHz, which coincides with the low-frequency part of electron spin fluctuations in spin systems. As such, NMR is an ideal tool for probing the spin LL physics in model materials. In the talk I will present recent results of NMR studies on two model materials: spin-ladder compound $CuBr_4(C_5H_{12}N)_2$ and spin-chain compound $BaCo_2V_2O_8$. I will focus on several observables accessible by NMR (transition temperature, order parameter, electron spin
fluctuations) in relatively rich phase diagrams of both model materials.

Voditelj seminara FO
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